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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/836,794	04/17/2001	Jeffrey Stewart	STEW-015A	6777

7590

04/24/2003

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EXAMINER

SAGAR, KRIPA

ART UNIT

PAPER NUMBER

1756

DATE MAILED: 04/24/2003

7

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/836,794

Applicant(s)

STEWART, JEFFREY

Examiner

Kripa Sagar

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 February 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 April 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. The amendment filed on 2/10/03 has been entered.

Claims 1, 3,6,12,14,17 have been amended; no new matter has been added.

Claims 1-22 are pending.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claim 17 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The *amended* claim recites the limitation of using a metal substrate made from a liquid film. The method of making such a substrate is not described.

Examiner recognizes that the original claim referred to a *maskant* on the metal substrate being made from a liquid film.

Claim Rejections - 35 USC § 103

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4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Pat.6345502 to Tai et al. in view of US Pat. 5618379 to Armacost et al. and further in view of US Pat 6033582 to Lee et al.

The application discloses a method of forming a thin supported film. The membrane-forming film is coated on one surface of a supporting substrate. A photoresist is coated on the opposite surface and patterned. The exposed areas of the substrate are etched through to form a perforated support for the membrane.

The claims recite the steps for forming the membrane, the materials of the substrate, the masks and the membrane.

Tai teaches a method of forming a parylene membrane on a Si substrate (Fig.1A-F). The steps include parylene deposition on *both* surfaces of the substrate and etching the silicon substrate. Conventional photolithographic methods are used for patterning the silicon. The areas to be protected during the etch, are masked by the photoresist (2;7-12). Tai teaches processing the Si substrate in vacuum, masking, liquid etching (with KOH), plasma etching, photolithographic patterning and etching a window in the substrate to form a supported membrane.

Tai does not teach masking for *deposition* of a coating, or plasma etching to promote coating adhesion to a surface.

Lee teaches the modification of the surface of a substrate prior to coating. In one embodiment stainless steel and other metals are plasma etched (11;35-12;5) to roughen the surface and promote adhesion of a polymer coating (14;10-40). The polymer coatings may be formed by plasma arc and vapor deposition processes (15;5-9).

Lee teaches that it is conventional to use static masks to protect the areas that are not to be etched (3;5-9). However it does not teach masking to prevent deposition of materials.

Armacost teaches the art of selectively masking a substrate to limit deposition of coatings from the vapor phase. In the vapor phase deposition of parylene it is well known to mask off protected areas. Masking tapes and soluble hydrocarbon films (beeswax) are routinely used as maskants. Following the coating operation the masks are removed (1; 11-37). Armacost discloses patterning a mask on a Si substrate and depositing parylene in the unmasked areas. The patterned mask may be formed by a shadow mask or a lithographic process using a photoresist (2;43-3;49).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to roughen the surfaces of substrates using a plasma etch, prior to coating a polymer film as taught by Lee and masking the protected areas of the substrate against deposition as taught by Armacost while forming the parylene membrane on a Si support as taught by Tai because Lee teaches that the plasma etch

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produces distinctive surface morphologies which promote reliable and functional adhesion of materials to surfaces (4;1-12) while Armacost teaches that deposit masking is conventional but in parylene coating the novel mask facilitates removal of the coating from undesired locations(1;38-44).

6. Claims 1,12 are rejected under 35 U.S.C. 103(a) as being unpatentable over International Pat. WO 01/022776 to Han et al. in view of the non-patent monograph of Licari et al. and further in view of US Pat. 3908075 to Jackson et al. and further in view of Armacost

Han teaches the fabrication of a parylene diaphragm on a Si-substrate (fig.3). The steps (p.5;10-29) comprise depositing a parylene film (312) on one surface of the substrate followed by patterning the backside of the substrate and etching the substrate to form a released diaphragm.

Han does not specifically list the steps of masking one surface, placing the substrate in vacuum, plasma etching the surface to be coated and coating the substrate in vacuum. It may be noted that Han forms the coating on only one surface of the substrate.

Patterning of substrates is conventionally carried out by photolithographic methods. This is illustrated by Jackson who fabricates a lead-frame from a composite layer (Fig.1) of metal (10) on a polymer support (11). The metal is photolithographically patterned and etched to form the circuits wherein the polymer (11) forms a window (fig.3).

The listed steps are conventional in a coating process and well known to one of ordinary skill in the art. This is shown by the monograph of Licari which teaches the use of parylene coatings in electronic applications (p.80-83), plasma cleaning of surfaces prior to coating (p.159-161) and vacuum deposition of polymers including parylene (p.184-186). Licari notes that parylene films are difficult to remove with conventional etchants or solvents (p.79). It teaches coating films from the vapor and liquid phases (p.162-195).

Licari does not teach masking a surface before coating. Armacost teaches the conventional use of a mask to protect surfaces and as shadow masks (1;5-6;47).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to form a thin supported film on a metal substrate as taught by Han with the photolithographic technique taught by Jackson, using the conventional vacuum deposition techniques taught by Licari and masking the surface as taught by Armacost, because Armacost teaches that the mask facilitates removal of the coating from undesirable areas while Licari points out that parylene coatings are not easily removed by conventional processes. The motivation for using Licari's vacuum deposition steps and Jackson's photolithographic methods in Han's process arises from the fact that these are well-known and commercially used processes which have been successfully used to form coatings and patterns, respectively for a very long time.

Response to Arguments

7. Applicant's arguments filed 2/10/03 have been fully considered but they are not persuasive.

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The invention describes a method of forming a thin supported film on a metal substrate by coating the obverse surface with the film-forming material and patterning and etching the reverse surface of the substrate.

The rejected claims recite the conventional steps used in vapor deposition (to form a film on a metal substrate) and photolithography to pattern and etch the metal substrate from the reverse surface.

Applicant has argued that Tai does not teach a metal substrate, masks both surfaces, and does not teach plasma etching or vacuum deposition. Tai does not remove the photoresist from the surface after patterning.

It is further argued that Lee or Armacost fail to teach a mask formed from a liquid film.

Tai teaches forming a diaphragm or a supported film on a Si-substrate which is a conductor and a metallic material. Applicant has not clarified the criticality of the substrate to the process or why it would be unobvious to apply the process to the listed metals. The process has been in practice in forming bio-medical devices and in TAB (tape-automated-bonding) structures in the semiconductor arts. Tai masks both surfaces since the process requires it; it would be a relatively simple manipulation to one of ordinary skill in the art to mask only one surface. The retention of the photoresist as a dielectric layer reduces process steps in Tai's fabrication. One of ordinary skill in the art would know to remove the layers that do not have a useful function.

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Applicant has argued against the individual references not teaching each and every element of the claims. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Masking-off surfaces against a coating or deposit is known prior-art according to Armacost (see above). Beeswax and tapes were commonly used, the former being applied from a liquid phase. Vacuum deposition and plasma cleaning are conventional fabrication processes routinely used in diverse arts as shown by Lee (2;39-43). Thus all the elements of the claims are taught by the cited references. The motivation for combining the references has been discussed above.

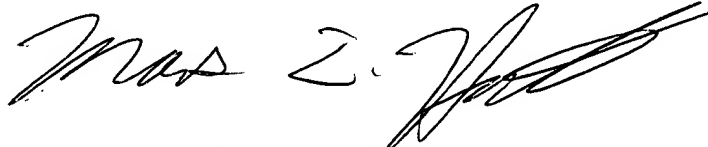
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kripa Sagar whose telephone number is 703-605-4427. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark F Huff can be reached on 703-308-2464. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

A handwritten signature in black ink, appearing to read "Mark F. Huff", with a long horizontal line extending to the right.

MARK F. HUFF
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700

MH/ks
April 16, 2003